Amendments to the Claims

The listing of claims will replace all prior versions and listings of claims in the application.

1. *(Currently Amended)* A modem for receiving a multitone signal having a plurality of symbols with a cyclic extension of length M samples transmitted through a channel, comprising:

a signal input for receiving the multitone signal; and

a transversal equalizer coupled to the signal input and including a finite impulse response filter having coefficients such that a combined impulse response of the channel and the transversal equalizer targets a target impulse response having N taps, where N and M are integers and N<(M+1);

wherein the target impulse response is represented by a data set having M+1 data elements, wherein at least a first or a last of the M+1 data elements is set to zero.

2. *(Previously Presented)* The modem according to claim 1, wherein the modem further comprises a bit adjustment means for lengthening or shortening a symbol for use in frequency domain interpolation.

3. *(Previously Presented)* The modem according to claim 1, wherein N=M.

4. *(Canceled)*

5. *(Previously Presented)* The modem according to claim 1, including a means for calculating the coefficients of the finite impulse response filter to minimize an error function of a difference between a convolution of the channel with the transversal equalizer and a target impulse response having N taps.

6. *(Previously Presented)* The modem according to claim 1, wherein a difference between the combined impulse response of the channel and the transversal equalizer and the target impulse response is minimized.

7. *(Currently Amended)* A method for equalizing a multitone signal formed of a stream of multitone symbols having an extension of length M samples passing through a channel with a finite impulse response filter having filter coefficients, including:

receiving the multitone signal from the channel;

passing the multitone signal through the finite impulse response filter;

delaying the multitone signal; [[and]]

adjusting the filter coefficients so that a combined effect of the channel and the finite impulse response filter on the multitone signal targets a target impulse response having N samples of the delayed multitone signal, wherein N and M are integers and $N<(M+1)$;

wherein the target impulse response is represented by a data set having M+1 data elements; and

setting at least a first or a last of the M+1 data elements to zero.

8. *(Previously Presented)* The method according to claim 7, further including adding or deleting bits to keep a phase rotation within predetermined limits.

9. *(Previously Presented)* The method according to claim 7, wherein N=M.

10. *(Canceled)*

11. *(Previously Presented)* The method according to claim 7, further including calculating the coefficients of the finite impulse response filter to minimize an error function of a difference between a convolution of the channel with a transversal equalizer and a target impulse response having N taps.

12. *(Previously Presented)* The method according to claim 7, further including minimizing a difference between

the combined impulse response of the channel and a transversal equalizer; and

the target impulse response.

13. *(Currently Amended)* A computer program recorded on a data carrier for cooperating with a computer system having a processor and a memory including code to cause the processor to carry out the steps of:

receiving a multitone signal having an extension of length M samples from a channel;

passing the multitone signal through a finite impulse response filter having filter coefficients;

delaying the multitone signal; [[and]]

adjusting the filter coefficients so that the combined effect of the channel and the finite impulse response filter on the multitone signal targets a target impulse response having N samples of the delayed multitone signal, wherein N and M are integers and N<(M+1);

wherein the target impulse response is represented by a data set having M+1 data elements; and

setting at least a first or a last of the M+1 data elements to zero.

14. *(Previously Presented)* The computer program according to claim 13, further including code for frequency modulating the multitone signal.

15. *(Previously Presented)* The computer program according to claim 13, wherein N=M.

16. *(Canceled)*

17. *(Currently Amended)* A system, comprising:

a first modem including

a cyclic extension addition module for adding M extension samples to a discrete multitone (DMT) symbol; and

a digital-to-analog converter for transmitting the DMT symbol and the M extension samples into a channel; and

a second modem including

a signal input connected to the channel; and

a transversal equalizer coupled to the signal input, the transversal equalizer including a finite impulse response filter having coefficients such that a combined impulse response of the channel and the transversal equalizer targets a target impulse response having N taps, where N and M are integers and N<(M+1);

wherein the target impulse response is represented by a data set having M+1 data elements, wherein at least a first or a last of the M+1 data elements is set to zero.

18. *(Previously Presented)* The system according to claim 17, wherein the first modem includes a frequency phase rotation means and a means for at least one of bit addition and deletion to adjust a phase of the DMT symbol and the M extension samples.

19. *(Previously Presented)* The system according to claim 17, wherein

the second modem further includes a second cyclic extension addition module and a second digital-to-analog converter; and

the first modem further includes a second signal input and a second transversal equalizer.

20. *(Currently Amended)* A method of modem communication, including:

transmitting a multitone signal having a phase from a first modem to a second modem through a channel, the multitone signal formed of plurality of symbols and having an extension of length M samples;

rotating the phase of multitone signal to align the plurality of symbols;

receiving the multitone signal from the channel;

passing the multitone signal through a finite impulse response filter having filter coefficients;

delaying the multitone signal; [[and]]

adjusting the filter coefficients so that the combined effect of the channel and the finite impulse response filter on the multitone signal targets a target impulse response having N samples of the delayed multitone signal, wherein N and M are integers and $N<(M+1)$;

wherein the target impulse response is represented by a data set having M+1 data elements; and

setting at least a first or a last of the M+1 data elements to zero.

21. *(Currently Amended)* The method of claim 20, further including adding a bit to ~~at least one of~~ the [[first]] multitone signal ~~and the second multitone signal~~ to align the plurality of symbols of the [[first]] multitone signal ~~and the second multitone signal~~.

22. *(Currently Amended)* The method of claim 20, further including deleting a bit from ~~at least one of~~ the [[first]] multitone signal ~~and the second multitone signal~~ to align the plurality of symbols of the [[first]] multitone signal ~~and the second multitone signal~~.